New windows on massive stars: asteroseismology, interferometry, and spectropolarimetry
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Observing programs, what are the priorities?

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Abstract. This brief note reflects the exchanges that were made between the participants during the general discussion on the observing programs. Because of time constraints only two questions have been addressed: 1) What is the priority between large programs and detailed observations of one or only a few objects? 2) Large surveys implies some automatic pipelines: what is their reliability? Elements of answers are given below. One interesting unexpected outcome of this discussion was the realization that a recent and up-to-date textbook on spectral synthesis is missing, while it would be an extremely useful tool for the community.

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1. Large programs vs. dedicate programs; applying for telescope time

The discussion first addressed the question of large programs (LP) versus dedicated programs. Large programs seem to be favored by Time Allocation Committees (TAC), likely because such programs are of interest for a large community, a point which is reflected by the fact that their results attract in general a lot of citations. Moreover, results obtained by LP can trigger further focused works on individual objects if the results are promising enough. For this to be possible however, the data should be reduced and made available quickly to all.

The pressure on focused programs is less high than on LP, but, sometimes, TAC may tend to reject such programs because of the existence of previous LP that may give the impression that the subject/object has already received all attention it deserves.

Although LP can provide extremely useful general trends, they are often not sufficient to fully answer a scientific question. The fact that, for LP, important amounts of data have to be analyzed, often implies shorter exposures and also some automatic pipeline for the reduction and analysis. In some cases, although some general trends can be correct, strong and useful conclusions may still need additional observations and/or reanalysis of the data. It happens that a small number of very carefully observed and analyzed objects brings new views that would have been out of reach by very large programs, due simply, as underlined above, to the limitations on the quality of the observables and of their analysis imposed by the too large numbers of objects to be treated in LPs. It happens also that some targeted observations can provide clues for physical processes having a very general application. In this respect the observation of the internal rotation of red giants is a very good example of an observation dealing with a small number of objects but potentially providing clues on the general process of angular momentum transport in stars.

From what precedes, one sees that large programs and dedicated ones have actually different purposes: while LP can provide a first global view of the question, targeted proposal can provide some refined clues. Thus it appeared important that observing time is obtained for both large and focused programs. In this respect, it was underlined

that the project MiMeS (Magnetism in Massive Stars) was a good example, since it had both approaches, allowing to obtain general trends for a whole population as well as detailed and accurate results for a selected cases.

2. Reliability of automatic pipeline reduction

The second question was then addressed: large surveys imply automatic pipelines. Is their reliability sufficiently tested? It was said that people in charge of LP have to keep testing the reliability all the time. But of course they have to stop at some point because they need to publish and communicate their results. In these publications, they need to explain what has been done and the limits of the technique.

The discussion then focused on the case of abundance determinations, since they represent key data for testing theories and models. Indeed, the surface abundances are crucial since different models predict different abundances. Without the surface abundances, asteroseismic models would not have much meaning. Also it is important for mass loss determinations.

The question of reliability of automatic pipelines and how to test its quality control becomes a concern for the ESO-GAIA survey in view of the number of planned targets that has to be analyzed. While for cool stars some automatic procedure is working fine, for hot stars all the work needs to be done by hand. Therefore the progress is very slow about which GAIA people are complaining, but it is necessary to do it carefully for hot stars. To get proper error bars on abundances, it is necessary to invest large amounts of time and it does appear very dangerous to have an automatic pipeline. Such automatic pipeline may work for a few stars and not for others, hence the need to do it case by case, and to do proper error analysis.

3. The lack of a textbook on spectral synthesis

It emerged from the discussion that there is no recent and up-to-date textbook on spectral synthesis. A call was made to anyone who has good notes on this topic to distribute them for the benefit of all of us. One participant mentioned that Y. Hubeny (with Mihalas) has finished their book on "Theory of Stellar Atmospheres". Among the important points that should be discussed in such a textbook are the big differences that are produced on the lines when NLTE effects are accounted for. The field of spectral synthesis is evolving rapidly. As an example, nitrogen-line formation has been explained only four years ago. Such progress is true of all active research fields and likely to have a textbook making the synthesis of the present status of the research in that area available would be an extremely useful tool for students and researchers. It was strongly hoped that people in this field could find a way to get organized to put such a, possibly multi-author, book together.

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